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AMSAT NEWS SERVICE
ANS-043

ANS is a free, weekly, news and information service of AMSAT North America, The Radio Amateur Satellite Corporation. ANS reports on the activities of a worldwide group of Amateur Radio operators who share an active interest in designing, building, launching and communicating through analog and digital Amateur Radio satellites.

Please send any amateur satellite news or reports to:

ans-editor@amsat.org

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ANS-043 AMSAT News Service Weekly Bulletins

AMSAT News Service Bulletin 043.01
  From AMSAT HQ SILVER SPRING, MD.
February 12, 2012
To All RADIO AMATEURS
BID: $ANS-043.01

AMSAT Fox-1 Cubesat Selected for NASA ELaNa Launch Collaboration

Project ELaNa, NASA's "Educational Launch of NanoSat" managed by the Launch Services Program at the Kennedy Space Center, announced on February 10 that the AMSAT Fox-1 cubesat has been selected to join the program.

NASA will work with AMSAT in a collaborative agreement where NASA will cover the integration and launch costs of satellites deemed to have merit in support of their strategic and educational goals.

AMSAT teamed with the ARRL to write and deliver the 159 page educa- tional proposal to NASA. Letters documenting the importance of AMSAT's satellites in the education programs at the ARRL and also at the Clay Center for Science and Technology at the Dexter and Southfield schools in Brookline, MA, were important parts of our proposal.

AMSAT President Barry Baines, WD4ASW said, "The ELaNA Launch opportunity marks AMSAT's return to space after the conclusion of the successful ARISSat-1/KEDR flight. We need to get the flight Fox-1, along with an operational flight backup satellite, built, integrat- ed, tested, and delivered. Our ability to provide a spacecraft and get it launched is

dependent upon the active support of our donors who wish to see Fox-1 fly."

AMSAT Vice-President of Engineering, Tony Monteiro, AA2TX noted this will provide a launch opportunity for AMSAT's next generation of FM repeater satellites with features and operation beyond the experience of AO-51. AMSAT's Fox-1 Engineering Team is making progress developing the advanced satellite that will provide these features:

+ Fox-1 is designed to operate in sunlight without batteries once the battery system fails. This applies lessons learned from AO-51 and ARISSat-1 operations.

+ In case of IHU failure Fox-1 will continue to operate its FM repeater in a basic, 'zombie sat' mode, so that the repeater remains on-the-air.

+ Fox-1 is designed as the immediate replacement for AO-51. Its U/V (Mode B) transponder will make it even easier to work with modest equipment.

+ From the ground user's perspective, the same FM amateur radio equipment used for AO-51 may be used for Fox-1.

+ Extending the design, Fox-2 will benefit from the development work of Fox-1 by adding more sophisticated power management and Software Defined Transponder (SDX) communications systems.

The Fox-1 Project presents an opportunity to literally put your call-sign on the Fox hardware. AMSAT is looking for major donations to help underwrite the cost of solar cells/panels, one of the more significant expenses of the project.

These solar cells are needed for the flight unit as well as for the a flight spare. As Fox-1 will have solar cells on all six sides of the spacecraft and given the relatively small surface area available on each side (at most 4" by 4" per side), AMSAT needs to invest in high efficiency solar cells to gain as much power as possible to operate the spacecraft.

Several opportunities to make your donation to keep amateur radio in space include:

+ Return the form sent with the letter to reply with your donation for the Fox-1 Project.
  - All donations over $40 will receive a Fox pin.
  - Donations of $120 or more qualify you for AMSAT President's Club

+ Call Martha at the AMSAT Office +1-888-FB AMSAT (1-888-322-6728)
+ Paypal donation widget on the main page at: http://www.amsat.org
+ Paypal donation widget for Project Fox at:
  http://www.amsat.org/amsat-new/fox/
+ You can also go to the Paypal site and send your donation to martha@amsat.org.
+ The AMSAT Store: http://www.amsat-na.com/store/categories.php

Project Fox web site provide a good overview of the technical progress of the new satellite: http://www.amsat.org/amsat-new/fox/

[ANS thanks AMSAT President Barry Baines, WD4ASW, AMSAT Vice-President of Engineering, Tony Monteiro, AA2TX and AMSAT's Project Fox Engineering team for the above information]

ESA Vega Launch Includes 8 Amateur Band Satellites

Vega is scheduled to launch on February 13, at 1000 UTC with eight student built amateur radio satellites. Internet video streaming of the launch will be available at:
http://www.videocorner.tv/index.htm

The launcher will first deploy the main payload LARES, the Laser relativity Spacecraft and will then make an additional firing of the final OVUM stage before deploying the secondary cubesat payloads. The planned timing for these deployments, in order of ejection, are as follows:

= T0+ 4245.30secs 1st PPOD, with XatCobeo, e-st@r, and Goliat.
= T0+ 4255.30secs 2nd PPOD, with Robusta, MaSat-1 and PW-Sat.
= T0+ 4265.30secs 3rd PPOD, with UniCubeSat.
= T0+ 4275.30secs AlmaSat-1.

The Cubesats will not deploy their antennas until >1800 seconds after they leave their PODS.It is not known how soon AlmaSat-1 will start transmitting after deployment.

Vega Launch Cubesat Amateur Band Frequencies:
+ AlmaSat-1 437.465 MHz 1200 bps FSK, 2407.850 MHz
+ E-St@r 437.445 MHz 1200 bps AFSK
+ Goliat 437.485 MHz 1200 bpx AFSK
+ MaSat-1 437.345 MHz GFSK 625/1250 bps, CW
+ PW-Sat 435.020 MHz FM uplink, 145.990 MHz DSB downlink
+ Robusta 437.325 MHz 1200 bps FM telemetry
+ UniCubeSat 437.305 MHz 9600 bps FSK
+ XaTcobeo 437.365 MHz FFSK with AX.25

Links to the home pages of the satellite teams are included on the http://www.amsat.org page. Extensive coverage of the launch and the satellites can also be found on the AMSAT-UK web:
http://www.uk.amsat.org/

An ESA video of all of the satellites aboard the Vega Maiden Flight can be viewed on YouTube at: http://tinyurl.com/ESA-Vega-Cubesats

The university cubesat teams welcome reception reports. All observ- ers are invited to submit reports via amsat-bb and to also join the CubeSat Internet Relay Chat channel to pass on their news and com- ments in realtime. You will need an IRC client such as the ChatZilla addon for FireFox or mIRC to join the cubesat chat:

1. Connect to the irc.freenode.net server.
2. Once connected to the server the /join #cubesat command will bring you into the channel.
3. Many users set their chat nickname to "name_callsign".

ChatZilla AddOn for Firefox:
https://addons.mozilla.org/en-US/firefox/addon/chatzilla/

mIRC
http://www.mirc.com/

[ANS thanks the CubeSat Teams for the above information]

ARISS Contact to Celebrate 50th Anniversary John Glenn Over Perth

On the 20th of February 1962 a Mercury-Atlas 6 spacecraft called "Friendship 7" was launched. In the hot-seat was Astronaut, John Glenn. The objective was to place a man into earth orbit, observe his reactions to the space environment and safely return him to earth to a point where he could be readily found.

During the first orbit of three, the spacecraft came into radio range of the Muchea Tracking Station where the first Australian space radio contact was made by Gerry O'Connor who spoke with John Glenn as he passed overhead.

One of the questions that was posed for this flight was "Can you see the cities of Earth from space?" To help answer that question, the people of the City of Perth all turned their lights on as John Glenn flew over. The answer to the question was a resounding "YES!", and Perth was nicknamed "The City of Light".

Fifty years later on February 20, 2012 young people from Western Australia will have the chance to ask a question of an astronaut or cosmonaut currently residing on the International Space Station. There will be a live radio and video connection to the space station at the Northbridge Piazza in Perth, Western Australia. Ten lucky winners of the student competition, selected from primary and secon- dary schools, will get to ask questions, and receive their answers in real time as the space station flies overhead.

>From a technical perspective, ARISS will configure a direct amateur radio link between the ISS and ham operator, Dick Flagg, AH6NM, in Honolulu. In Perth, members of the Hills Amateur Radio Group will provide a phone link between AH6NM and Northbridge Piazza so the stu- dents can converse with the astronaut. Tony Hutchison, VK5ZAI, ARISS Mentor for Australia is conducting the behind the scenes preparation.

The event begins at 17:00PM Perth time (0900 UTC) on February 20. The currently scheduled contact time is approximately at 10:22 UTC, sub- ject to last minute change depending upon events aboard the ISS or orbit changes.

In addition to the ARISS contact, web-streaming and other space act- ivities such as a radio telescope, optical telescopes, museum exhibi- tions, an address by the Lord Mayor of Perth, a video message from John Glenn and a presentation by the Western Australia Chief Scientist are planned.

The press release of the City of Lights ARISS event, issued by the Government of Western Australia can be read on=line at:
http://tinyurl.com/WA-PressRelease

Web pages with more information of the event can be found at:
http://harg.org.au/ariss/
http://museum.wa.gov.au/city-lights

[ANS thanks Richard, G4TUT and David Jordan, AA4KN, ARISS Public Relations, Australia ARISS Coordinator Tony Hutchison, VK5ZAI for the above information]

Open Mission Control Software for CubeSat Project Teams

CubeSat developers may be interested in learning more about the Open Mission Control software, an open source, open access software for monitoring and controlling small spacecraft. The software is designed to provide an application and framework that can be adapted quickly and easily to support a variety of spacecraft including CubeSats, myPocketQubs and NanoLab experiments, and sounding rocket and high altitude balloon experiments. The team include students, space pro- fessionals, educators and enthusiasts from around the world, all working together to build a great mission control application for small spacecraft projects.

The Open Mission Control framework consists of the application and graphical user interface which contain the basic structure of the program, and the Open Mission Control toolbox, which provides a number of ready to use functions typically required for mission control applicationa.

The Open Mission Control application and graphical user interface can be adapted to a project quickly and easily, by populating them with elements from the Open Mission Control toolbox and other stan- dard library elements. This approach allows also users with limited programming experience to create sophisticated mission control soft- ware by building on a solid basic implementation.
Use and verification.

Designed to work with any spacecraft project, the first flight mis- sion that is expected to use Open Mission Control is myPocketQub 442. myPocketQub 442 was selected to fly as a pocket spacecraft attached to UKube-1, the first United Kingdom Space Agency CubeSat. It is expected to be the first mission controlled by Open Mission Control and to demonstrate and verify various use cases:

+ The first use case is for professional monitoring, command and control of a real spacecraft.

+ The second use case involves schools and universities using Open Mission Control to upload their virtual payloads for their Open- Space365 projects, monitor their experiments as they run and down- load the data for analysis.

+ The third use case involves the use of Open Mission Control as monitoring software for the various scientific and engineering sub-payloads that will fly on myPocketQub 442. The students con- ducting these experiments will use Open Mission Control to access and store the data from these payload experiments for analysis and research.

+ The fourth use case is communication with engineering models of the real spacecraft which will be made available on the Internet. These engineering models are duplicates of the flight hardware and allow Open Mission Control to command and monitor them and their sub-payloads in real time and to simulate different critical mis- sion phases under real conditions.

Additional information and links are available on the Open Mission Control webpage at: http://openmissioncontrol.wordpress.com/

[ANS thanks the Open Mission Control Team for the above information]

NASA astronaut Janice Voss, KC5BTK Passes

NASA astronaut Janice Voss passed away from cancer overnight. One of only six women who have flown in space five times, Voss' career was highlighted by her work and dedication to scientific payloads and exploration. Janice supported SAREX during her flights on the Space Shuttle. She was a phone-in speaker during one of AMSAT's multi-media Dayton Forum presentations with Roy Neal as MC. Janice held the call sign KC5BTK.

Voss began her career with NASA in 1973 while a student at Purdue University. She returned to NASA in 1977 to work as an instructor, teaching entry guidance and navigation to space shuttle crews. After completing her doctorate in 1987, she worked within the aerospace industry until she was selected as an astronaut in 1990.

Voss' first spaceflight mission was STS-57 in 1993, the first flight of the Spacehab module. She next flew on STS-63 in 1995, a mission to the Mir space station, and third flight of Spacehab. She also flew as a payload commander on STS-83 in 1997 with the Microgravity Science Laboratory, but the mission was cut short due to problems with one of the orbiter's three fuel power generation units. Voss, the crew and MSL flew again as the STS-94 MSL-1 Spacelab mission, focused on materials and combustion science research in microgravity.

Her last mission was STS-99 in 2000, a flight to the International Space Station as part of the Shuttle Radar Topography Mission which mapped more than 47 million square miles of the Earth's land surface.
In total, Voss spent more than 49 days in space.

Peggy Whitson, chief of the Astronaut Office said, "By improving the way scientists are able to analyze their data, and establishing the experimental methods and hardware necessary to perform these unique experiments, Janice and her crew ensured that our space station would be the site of discoveries that we haven't even imagined."

For Voss' complete biography, please visit:
http://www.jsc.nasa.gov/Bios/htmlbios/voss-jan.html

[ANS thanks Frank Bauer, KA3HDO and SpaceRef.com for the above information]

SumbandilaSat SO-67 Amateur Transponder Recovery Work in Progress

It would appear that prior reports on the demise of South Africa's SumbandilaSat were 'greatly exagerated' (with apologies to author Mark Twain).

A report on the Southern African AMSAT website says partial recov- ery is possible for Amateur Radio Operation to possibly resume in March 2012.

"We have not given up on our efforts to get SumbandilaSat working again even if it is only partially", said Johan Lochner ZR1CBC who is spending much time on the recovery process and many nights burn- ing the midnight oil working on new and more intelligent algorithms.
He and his colleagues are making every effort to get the satellite working again.

SumbandilaSat experienced a corruption in the programme memory of one of

the power switches. This is the interface unit which con- trols a robust orientation control implementation system which is using output from the magnetic sensors to point the solar panels to- wards the sun in a safe mode scenario when for example communica- tions with the ground segment was not possible for a few days.

The corruption of the program memory prevented the magnetic inter- face unit from automatically switching on after power-up and thus preventing access to measurements taken by the magnetometer.

Johann said, "As a result of the malfunction of the magnetic control unit the satellite started to slowly point away from the sun with intermittent sun eclipses. When there was no power flowing from the solar cells the batteries drained and we could not in a safe way communicate with the satellite, so we backed off. Once we determined this pattern we stopped communicating with the satellite when we did not see sufficient charge on the batteries. At other times we had good communication when could diagnose what was going on. Dur- ing good communication windows that could last 2 or 3 days we tried to diagnose the exact nature of the problem in the same way as we had done before and we started to implement a fix. The particular power switch that failed was already the redundant one so we were in a worse state than before."

SumbandilaSat controllers implemented automated ground segment soft- ware to make contact with the satellite from both SANSA Space Opera- tions and the Electronic Systems labs at SU. The objective was to contact the satellite automatically and to try to implement the recovery procedure and also notify the team if any contact was made.

Johann continued, "By mid-November 2011 we again made contact with SumbandilaSat and set in place a planned recovery procedure. Within 3-4 days we came to the conclusion that the main battery had failed. Earlier the intermittent contact was because the battery could not be fully charged and that satellite power bus was too low for the processors and transmitter to function. We surmised that during the month that we had no contact that the battery must have gone open circuit. With the battery no longer on the power bus, the voltage on the bus would rise to 28.5 volts and supply enough current to support operations when SumbandilaSat was in full sunlight."

The SumbandilaSat concludes, "We are determined to get this working and to maintain the scientific value of the satellite as much as possible. Johann's focus is now on getting the amateur radio trans- ponder working, which with the loss of AO-51 will be a great asset to amateur radio satellite activity. By the end of February we hope to achieve this!"

Uplink: 145.875 MHz (no tone required)
Downlink: 435.345 MHz

See: http://www.amsatsa.org.za/SumbandilaSat.htm for full coverage of this news.

[ANS thanks SA AMSAT and Johan Lochner, ZR1CBC for the above information]

AMSAT Notes:

AMSAT Fox Project Flyer

Patrick Stoddard, WD9EWK has put together a nice 4 page pdf description of the Fox project. This is available directly from this URL: http://www.amsat.org/amsat-new/fox/AMSAT_Fox-20120206.pdf or the link can be found midway down the Fox page on the AMSAT Web site.
More detailed information about the Fox project can be found in the Fox area of the AMSAT Web site.

AMSAT Annual Meeting dates set

The 2012 AMSAT Annual Meeting and Symposium will be held Oct 26-28,2011 at the Holiday Inn Orlando Airport. More details as they become available.

AMSAT at Dayton 2012

The AMSAT Dayton team is busy preparing for the AMSAT presence at this years Hamvention - May 18-20, 2012. Same booth spaces next the the ARRL area, outdoor satellite demonstration area and it looks like the AMSAT Forum will be Saturday morning. Additional information and web site area soon.

[ANS Thanks Gould, WA2SXM, for this information]

Amateur Radio on the International Space Station (ARISS) Status Report
February 6, 2012

1. Upcoming School Contacts

An Amateur Radio on the International Space Station (ARISS) contact was successful for Inuksuk High School, Iqaluit, Nunavut, Canada on Wednesday, February 8 at 15:18 UTC via telebridge station AH6NM in Hawaii. The school has formed a space club through which students are learning about the ISS via videos, the internet and guest speakers. They are learning how to track the ISS and are completing space-related projects. Radio usage and protocol have been discussed. First Air and the Makivik Corporation are the sponsors that ensure ARISS contacts are supported in the remote areas of Northern Canada.

Soumuta Elementary School, located in Kagoshima, Japan scheduled for an Amateur Radio on the International Space Station (ARISS) contact on Saturday, February 11 at 10:33 UTC was successful. The school was established in 1972 and has a current enrollment of 479 students. Students are learning about the mission of the ISS and will experience amateur radio concepts through their contact.

2. Polish Students Experience Successful ARISS Contact

On Saturday, February 4, students attending the Zespol Szkol nr 8 in Walbrzych, Poland participated in an Amateur Radio on the International Space Station (ARISS) contact with Don Pettit, KD5MDT on the ISS. Radio station W6SRJ in California provided the telebridge connection. Greetings were exchanged and students were able to get through all the space-related questions they had prepared. The contact was integrated into a curriculum covering electronics, microprocessor systems and English and drew interest from the school's robotics and amateur radio clubs. Contact audio was fed into EchoLink and IRLP (Internet Radio Linking Project). Representatives from radio and television stations provided media coverage.

3. ARISS-U.S. to Review Proposals Submitted

The NASA Teaching From Space office received over 100 inquiries about the U.S. proposal process for ARISS contacts that will be scheduled during the July 2012 - January 2013 time frame. Twenty-three schools met the January 30 deadline and submitted proposals. The next step is for the U.S. Selection Committee to review the proposals and select the U.S. schools in about one month. Another window of opportunity for U.S. schools and organizations to submit proposals will open later in the year.

4. AMSAT News Service on ARISS

The February 5 AMSAT (Radio Amateur Satellite Corporation) News Service bulletin (ANS-036) included an item about the successful amateur radio satellite, SuitSat, titled, "Remembering Mr. Smith - SuitSat-1 February 3, 2006." Another piece covered the recent ARISS contact with El Dorado County students. To view the articles, see: http://amsat.org/pipermail/ans/2012/000589.html

5. Amateur Radio Newsline Covers ARISS

On February 3, Amateur Radio Newsline posted the winners of the ARISSat Chicken Little Contest in its report #1799. To read, "Ham Radio in Space: Winners of ARISSat-1 Chicken Little Contest Announced," see: ftp://ftp.arnewsline.org/quincy/News/news.txt

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In addition to regular membership, AMSAT offers membership in the President's Club. Members of the President's Club, as sustaining donors to AMSAT Project Funds, will be eligible to receive additional benefits. Application forms are available from the AMSAT Office.

73,
This week's ANS Editor,
Dee Interdonato, NB2F